DOCUMENT RESUME

ED 110 762 CE 004 570

TITLE	Occupational Exploration for Small High Schools. Final Report.
INSTITUTION	Hereford-Unity School District, Oreg.
SPONS AGENCY	Oregon State Board of Education, Salem. Div. of Community Colleges and Career Education.
PUB DATE	11 Jul 72
NOTE	24p.; A report of Burnt River High School, Unity, Oregon; Best copy available
EDRS PRICE	MF-$0.76 HC-$1.58 Plus Postage
DESCRIPTORS	*Career Education; Career Exploration; *College High School Cooperation; Course Descriptions; *Demonstration Programs; Pilot Projects; *Program Descriptions; Secondary Education; *Small Schools

ABSTRACT

The report describes a program whose primary objectives were to develop a model program wherein the resources of the community college and the secondary school are utilized to expand occupational education opportunities in a manner that related high school education to the world of work, and to provide secondary students with programs of occupational orientation, exploration, occupational cluster training, counseling and guidance in small, isolated high schools whose size and resources have restricted their programs in the past to instruction aimed primarily at preparation for college. The two-year program involved career education training for instructors, aids, and consultants in two relatively isolated Oregon secondary schools; career education instruction for the schools' students by means of learning packages; and a mobile career education laboratory. The report's summary and conclusions indicate that the program was a success. Half the document consists of course outlines for the following 10 courses: welding, small engines, gas engine trouble shooting, construction skills, drafting, commercial design, consumer problems, child care and development, clothing construction, and personal development. (Author/JR)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

412.04
S263
cop. 3

ED110762

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

FINAL REPORT

Occupational Exploration For Small High Schools

Project Director
Bob Savage

Burnt River High School
Unity, Oregon

July 11, 1972

Retrieval - Dissemination Center
Oregon Board of Education
942 Lancaster Drive N.E.
Salem, Oregon 97310
Phone: 378-3566

OREGON BOARD OF EDUCATION

INSTRUCTIONAL SERVICES-CAREER EDUCATION

EXEMPLARY

CE004570

BEST COPY AVAILABLE

JUL 14 1973

FINAL REPORT

Occupational Exploration For Small High Schools

(Project No. 01-030-402)
(Grant No. 10442)

only copy

Retrieval - Dissemination Center
Oregon Board of Education
942 Lancaster Drive N.E.
Salem, Oregon 97310
Phone: 378-3566

Bob Savage
Name of Project Director

Burnt River High School
INSTITUTION OR AGENCY

Unity, Oregon
CITY AND STATE

07-11-72
Date

OREGON BOARD OF EDUCATION

INSTRUCTIONAL SERVICES-CAREER EDUCATION

EXEMPLARY

413.01
0-8
cop. 3

ABSTRACT

Occupational Exploration for Small High Schools

Bob Savage, Project Director
Burnt River High School

Objectives:

1. To develop a model program wherein the resources of the community college and the secondary school are utilized and, through cooperative planning and effort to expand occupational education opportunities in a manner that relates high school education to the world of employment.
2. To expand and improve occupational education opportunities in two small, isolated high schools by contracting for secondary instruction with a community college.
3. To provide secondary students with programs of occupational orientation, exploration, occupational cluster training, counseling and guidance in small, isolated high schools whose size and resources have restricted their programs in the past to instruction aimed primarily at preparation for college.
4. To develop a workable plan for the deployment of staff and material on a rotating basis, utilizing both community college and high school resources to accomplish collectively what could not be accomplished by the secondary schools alone.

Recommendations:

A. Small schools systems should seek to combine efforts with other small schools to mutually enhance their capabilities. The project currently requesting funding, referred to as SIXCO, has considerable merit and small schools that can participate will greatly enhance student and community opportunities.

B. A career education program should continue to operate within the two participating schools and, in fact, is being planned in cooperation with Treasure Valley Community College.

C. Follow-up of students is critical in determining directions to take. A questionnaire is being developed locally to follow students with respect to application of their training.

D. Parental involvement is essential to understanding and acceptance of career education in small communities. Involvement in Adult Education programs and parent-teacher conferences are two activities that have proven successful in attaining community acceptance and understanding.

E. "Mobile labs" should be utilized by small schools in making facilities more useable and accessible to more people. These units reduce the "per-student" cost of career education and provide communities with facilities not obtainable without cooperative efforts.

F. Small schools should evaluate their communities for the inclusion of local talent in programs as aides and consultants. These activities lend both economy and "vitality" to career education. The "vitality" comes in terms of added realism and a variety of approaches as well as added insights into career opportunities.

I. Background And Introduction

A. Huntington and Burnt River school districts each had programs primarily serving students desiring a college preparatory program prior to the project. Both school boards had expressed the need for development of occupational programs and requested aid from Treasure Valley Community College. At that point a proposal was written and submitted to the Oregon Board of Education for an Exemplary Program with the following objectives:

OBJECTIVES

1. To develop a model program wherein the resources of the community college and the secondary school are utilized and, through cooperative planning and effort to expand occupational education opportunities in a manner that relates high school education to the world of employment.

2. To expand and improve occupational education opportunities in two small, isolated high schools by contracting for secondary instruction with a community college.

3. To provide secondary students with programs of occupational orientation, exploration, occupational cluster training, counseling and guidance in small, isolated high schools whose size and resources have restricted their programs in the past to instruction aimed primarily at preparation for college.

4. To develop a workable plan for the deployment of staff and material on a rotating basis, utilizing both community college and high school resources to accomplish collectively what could not be accomplished by the secondary schools alone.

5. Through provision of the above explained occupational exploratory program the following activities will take place:

   a. Sixty participants will explore a series of at least three occupational clusters.

   b. Each participant will gain a minimum of 80% of the basic skills outlined for each cluster explored.

   c. Each participant will develop a personal vocational plan for at least one occupational area. Each plan will include:

      (1) Jobs available for cluster chosen

      (2) Salary and fringe benefits

      (3) Working conditions

      (4) Training required

      (5) Methods of obtaining training

      (6) Advanced potentials

   d. At end of exploration period 75% of the participants will have made a tentative occupation cluster choice.

B. Educational Setting

1. Burnt River and Huntington School districts are isolated from population centers by 80 and 40 miles respectively. The economic bases of the communities are essentially farm, ranch and timber oriented with the major emphasis in terms of numbers involved being ranching. The students involved in the project were 9 - 12 grade youngsters, both female and male, with an interest in exploring occupational choices. Occupational exploration existing prior to project was limited to opportunities existing within the respective communities.

2. Numbers of people involved:

   a. Students. The classes averaged 15 students per class. The class count for the two years of the project was 480. This represented 50% of the eligible students.

   b. Other personnel. During the two years five administrators, 12 instructors, and 34 aides and consultants participated in the project.

II. Major Outcomes

A. Staff Development

During the two year project the local school personnel were trained in recognizing career education opportunities, scheduling to allow program variations, career counseling, and career education instruction. A cadre of career education instructors was trained in developing and teaching "packaged" career education programs.

B. Instructional Programs

1. Packaged programs were developed.
2. Local schools developed SUTOE programs to incorporate into their regular programs.
3. The local guidance staffs developed a Career Guidance program which included the use of GATB and SRA Occupational Outlook tests.
4. The "mobile" lab concept was field tested at the two schools. The laboratory was actually "portable" in that there was no common facility but all equipment was shared between the two schools and transported from one to the other.
5. A shop facility was built by the students as a project within a building construction unit.
6. Adult education programs were offered through the use of the "portable" labs which involved the local parents in the programs.

C. Materials and Content Developed

1. Packages in career exploration were built around the following units: Welding, small engines, personal development, construction skills, electricity, engine trouble shooting and repair, consumer education, and clothing construction.

III. Summary

A. Fifty percent of the eligible students at the two schools were actively involved in career exploration during the two years.

B. The "mobile lab" concept was successfully field tested.

C. Adults within the two small districts were enrolled in evening classes previously unavailable.

D. Local talent was involved in programming as aides and consultants.

E. Scheduling difficulties were identified and resolved.

F. A core of instructors were trained in teaching career exploration in units at various and changing locations.

G. Career exploration materials were developed in several areas beyond those previously available.

H. Staff acceptance of career education was enhanced in the two schools.

I. Career guidance programs were incorporated in the educational programs of the two schools.

J. Career education facilities were developed at each school.

K. A concept of contracting for educational services was field tested.

IV. Conclusions

A. Students in small schools are receptive to career exploration and will participate in programs that demonstrate tangible benefits.

B. "Mobile labs" are feasible and can reduce the economic burden of career education when small school districts with limited resources are involved.

C. Adult citizens in small, isolated communities felt a need for educational activities and will involve themselves in programs that promise tangible benefits.

D. Local people, even in small communities, possess many talents that can be utilized in career education resulting in increased community involvement.

E. Scheduling problems can be worked around and with faculty cooperation reasonable career education programs can be developed.

F. It is possible to develop a cadre of people to travel to various locations to teach units in Career Education. With proper supervision and scheduling this plan is feasible and stimulates student interest. This stimulated interest may possibly be related to the variety of instructional approaches.

G. Career exploration opportunities of small schools can be greatly expanded through this system.

H. Local staff involvement in developing the program is crucial to success of career education.

I. Career guidance programs naturally develop from an instructional program that includes Career Exploration opportunities.

J. Student-developed facilities can enhance instruction and involvement in Career exploration.

K. Contracting with larger educational institutions for instructional and organizational services can enhance local programs of small schools at a reasonable price.

V. Recommendations

A. Small school systems should seek to combine efforts with other small schools to mutually enhance their capabilities. The project currently requesting funding, referred to as SIXCO, has considerable merit and small schools that can parti cipate will greatly enhance student and community opportunities.

B. A career education program should continue to operate within the two participating schools and, in fact, is being planned in cooperation with Treasure Valley Community College.

C. Follow-up of students is critical in determining directions to take. A questionnaire is being developed locally to follow students with respect to application of their training.

D. Parental involvement is essential to understanding and acceptance of career education in small communities. Involvement in Adult Education programs and parent-teacher conferences are two activities that have proven successful in attaining community acceptance and understanding.

E. "Mobile labs" should be utilized by small schools in making facilities more useable and accessible to more people. These units reduce the "per-student" cost of career education and provide communities with facilities not obtainable without cooperative efforts.

F. Small schools should evaluate their communities for the inclusion of local talent in programs as aides and consultants. These activities lend both economy and "vitality" to career education. The "vitality" comes in terms of added realism and a variety of approaches as well as added insights into career opportunities.

FINAL REPORT
SMALL SCHOOLS PROJECT
TWO YEAR PROJECT - 1970-71 and 1971-72
BURNT RIVER HIGH SCHOOL and HUNTINGTON HIGH SCHOOL

The theme of courses taught were:

Occupational exploration for high school students enrolled in small schools.

The equipment, supplies, materials, travel, instructors, and supervision for the project were shared by Treasure Valley Community College, Huntington and Burnt River via a mobile situation. Courses were rotated throughout the school year as scheduled by the superintendent of each school.

The courses conducted were in the following areas:

Welding	Commercial Design
Small Engines	Consumer Problems
Gas Engine Trouble Shooting	Child Care and Development
Drafting	Clothing Construction
Construction Skills	Personal Development

Format of instruction:

A. Exploring the world of work
   1. Job opportunity
   2. Economic return
   3. Advancement
   4. Self employment
   5. Educational and skill requirements

B. Activities
   1. Research and self evaluation
   2. Buzz sessions
   3. Field studies
   4. Skills activities
   5. On-the-job experience

C. Evaluation follow-up
   1. Student questionnaires
   2. Evaluation-Discussion -- Directors, Supervisors, and Superintendent of schools
   3. Superintendent and High School staff members

D. Course outlines
   1. Clothing Construction
      a. First Session
         (1) Organization of class
         (2) Shopping list (equipment and fabric)
         (3) Fabric selection
         (4) Pattern selection (try on fitting shells)
         (5) Preparation of 1 yard of fabric for the construction of hostess apron

b. Second Session
   (1) Demonstration, construction of hostess apron
   (2) Preparation of pattern for cutting
   (3) Preparation of fabric for cutting
   (4) Layout of skirt pattern pieces on fabric
   (5) Cutting of skirt
   (6) Transfer pattern markings to cut fabric
   (7) Assemble cut skirt pieces for unit construction

c. Third Session
   (1) Construction of skirt
   (2) Placing pleats
   (3) Setting in pocket sections
   (4) Seams
   (5) Hem treatment
   (6) Zipper attachment
   (7) Band construction triple fold band

d. Fourth Session
   (1) Band application
   (2) Hook attachment
   (3) Eye construction
   (4) Skirt final pressing
   (5) Blouse pattern placement on fabric
   (6) Cutting of blouse
   (7) Transfer pattern marking to cut fabric

e. Fifth Session
   (1) Assemble cut blouse pieces for unit construction
   (2) Blouse back unit
   (3) Blouse front unit
   (4) Pocket application
   (5) Shoulder seams
   (6) Armseye facing unit
   (7) Facing attachment
   (8) Neck facing unit
   (9) Collar unit
   (10) Collar attachment
   (11) Facing attachment
   (12) Back neckline finish
   (13) Join side seams
   (14) Hem treatments
   (15) Hook attachment, eye construction
   (16) Blouse final pressing
   (17) Bias scarf
   (18) Tailored bow

f. Sixth Session
   (1) Skirt alterations
   (2) Skirt shell fitting
   (3) Skirt alterations
   (4) Layout of dress skirt pattern on fabric
   (5) Cut skirt honoring necessary alterations
   (6) Transfer pattern markings to fabric

g. Seventh Session
   (1) Bodice shell fitting

(2) Bodice alterations
(3) Layout of bodice pattern on fabric
(4) Cut bodice honoring necessary alterations
(5) Transfer pattern marking to fabric
(6) Interfacing cutting
(7) Assemble cut dress pieces for unit construction

h. Eighth Session
(1) Skirt front
(2) Skirt back
(3) Skirt pleat
(4) Hem of skirt
(5) Skirt stay attachment
(6) Skirt final pressing
(7) Skirt fitting

i. Ninth Session
(1) Bodice back attachment of interfacing
(2) Bodice front attachment of interfacing
(3) Bound buttonhole
(4) Should seam joining
(5) Neck facing unit
(6) Sleeve construction

j. Tenth Session
(1) Sleeve attachment
(2) Sleeve heading attachment
(3) Attachment of fastenings
(4) Bodice final pressing
(5) Bodice and skirt joining
(6) Zipper application
(7) Belt guide construction

k. Eleventh Session
(1) Belt construction
(2) Buckle construction
(3) Bias scarf
(4) Covered buttons
(5) Gusset application
(6) True bias cutting
(7) Welt cord construction
(8) True bias preparation for trim

l. Twelfth Session
(1) Completed garment
(2) Arrangement for final test
(3) Notebooks
(4) Modeling of garments
(5) Plan ahead for future class

2. Welding
a. Principles of Welding
(1) Versatility of welding and braizing metals
(2) Economic feasibility of welding metals

b. Welding machines and torches
   (1) Components and functions of electric and acetylene welders.
   (2) Care and safety of arc welders
   (3) Care and safety of acetylene welders
   (4) Personal and shop safety
   (Emphasis will be placed on safety throughout the entire course)

c. Fusion of metals
   (1) Identification of electrodes fillers
   (2) Identification of metals
   (3) Metallurgy
   (4) Economy in welding of weldments
   (5) Effect of heat on metals
   (6) How to minimize distortion of weldments

d. Blueprint and layout
   (1) Blueprint reading
   (2) Welding symbols
   (3) Layout of weldments

e. Laboratory
   (1) Practice of overhead, vertical, horizontal, and flat welding
   (2) Single and multiple pass butt and fillet welds
   (3) Braizing and cutting
   (4) Fabrication and repair welding

3. Drafting
   a. Introduction to technical drawing
      (1) History of drawings
      (2) Graphic Language
      (3) Definitions

   b. Drawing equipment
      (1) T-square and/or drafting machine
      (2) Drafting pencils
      (3) Alphabet of lines
      (4) Eraser and erasing shield
      (5) Triangles
      (6) Scales
      (7) Drawing instruments
      (8) Irregular or French curve
      (9) Types and sizes of drawing papers
      (10) Lettering guide line instruments

   c. Lettering
      (1) Styles
      (2) Techniques of lettering
      (3) Guide lines
      (4) Correct size and shape
      (5) Spacing
      (6) Lettering devices
      *(7) Lettering application

*15 minutes of lettering exercise will be assigned for every three hours of laboratory time.

d. Geometric construction
   (1) Geometric shapes
   (2) Geometric construction methods and techniques
   (3) Application problems

e. Sketching
   (1) Types of sketches
   (2) Methods of sketching
   (3) Sketching of curves
   (4) Choice of views
   (5) Application problems

f. Orthographic projection
   (1) Planes of projection
   (2) Visualization of views
   (3) Showing of hidden features
   (4) Precedence of lines
   (5) Selection of views
   (6) Application problems

g. Dimension practices
   (1) Lines of dimensioning
   (2) Placement of dimensioning and extension lines
   (3) Arrowheads
   (4) Fractions
   (5) Dimensioning of angles and arcs
   (6) Notes
   (7) Unidirectional and aligned system of dimensions
   (8) Application problems

4. Construction skills
   a. Forms, concrete work
      (1) Laying out foundation
      (2) Using batter boards
      (3) Making a miter box
      (4) Foundations and footings
      (5) Cast-In-Place concrete walls
      (6) Making good concrete
      (7) Mixing concrete
      (8) Placing concrete
      (9) Curing concrete
      (10) How to figure quantities
      (11) Basement walls of Cast-In-Place concrete
      (12) Reinforcement
      (13) Foundation forms
      (14) Provisions for drainage
      (15) Concrete floor on ground
      (16) Granular fill
      (17) Subgrading
      (18) Provisions for mechanical trades
      (19) Dampproofing
      (20) Insulation
      (21) Floor finishes
      (22) Permanent steps
      (23) Porch floors
      (24) Concrete walks
      (25) Flagstone walks

b. Wood identification
   (1) Special insert on how to identify native woods, with descriptions, and full-color photos showing grain patterns, and other characteristics of 32 different species.

c. Lumber - Measuring and selecting
   (1) Yard lumber
   (2) Abbreviations
   (3) Standard sizes
   (4) Suitability of various woods
   (5) Keeping lumber in conditions
   (6) Modular design
   (7) Lumber grades
   (8) Framing lumber
   (9) Exterior trim-board foot table
   (10) Subfloors
   (11) Wall sheathing
   (12) Lumber terms
   (13) Roof boards
   (14) Siding-flooring
   (15) Kitchen flooring
   (16) Porch flooring
   (17) Sash
   (18) Shelving
   (19) Using standard size lumber and millwork
   (20) Shingles
   (21) Stepping
   (22) Interior Trim
   (23) Lath

d. House framing methods
   (1) Balloon framing
   (2) Western or platform framing
   (3) Modern frame

5. Personal Development
   a. Poise
      (1) Walk
         (a) good walking practices
         (b) common walking posture faults
            1- sway back
            2- off-balance weight
            3- ungainly stride
            4- out-thrust neck
            5- bounce
         (c) proper convenances
            1- purses
            2- gloves
      (2) Stand
         (a) proper modes of stance
         (b) what to do with hands while standing
      (3) Sitting
         (a) balance-lowering
         (b) rising from sitting

(c) what to do with
1- legs
2- hands
3- skirt
(4) Entering and leaving a room
(5) Getting in and out of an auto

b. Speech - voice
(1) Voice faults
(a) careless habits
(2) Speech faults
(a) careless habits
(3) Quality of voice
(a) mechanical
(b) emotional
(4) Jaw, lips, tongue
(a) exercises
(5) Enunciation
(6) Pronunciation
(7) Slang and cliche's
(8) Arts of conversation
(a) conversational responsibilities
(b) opening "gambits"
(c) develop creative listening
(9) Good manners of conversation
(a) no monologues
(b) no foreign language
(c) no guest left out
(d) no "attacks" on anything
(e) no strong statements on moral or ethical questions

c. Body toning and conditioning
(1) Nutrition and your figure
(a) protein
(b) carbohydrates
(c) fats
(d) vitamins
(e) minerals
(f) dietary reducing and gaining
1- calorie count

d. Manners - etiquette
(1) Never forget to be a lady
(2) Ideal behavior
(a) good manners
1- attitude of consideration for others
2- must be felt as well as learned
3- use of tact
(b) etiquette
1- set of rules of appropriate procedure and behavior
(c) good taste
1- personal sense of modesty and reticence
(3) Introductions
(a) when to make introductions
(b) how to make introductions
(c) acknowledging introductions

(4) Business etiquette
- (a) job interview
- (b) conduct with management
- (c) conduct with co-worker

(5) Telephone etiquette
- (a) voice tone
- (b) identification
- (c) taking of messages
- (d) brief conversation

(6) Table manners
- (a) eating in public
  - 1- ordering
- (b) seating arrangement
- (c) paying
- (d) sitting
  - 1- proper way

(7) Entertainment
- (a) tea
- (b) receptions
- (c) dinner

e. Grooming

(1) Facial make-up
- (a) color type
- (b) skin type
  - 1- dry
  - 2- sensitive
  - 3- oily
  - 4- combination
- (c) face shape
- (d) type of make-up
  - 1- choosing your type
- (e) application of make-up

(2) Eyes
- (a) types of glasses
- (b) eyebrows and eyelashes
- (c) ways to accent eyes

(3) Hair
- (a) styles for individual's face
- (b) care of one's hair
  - 1- shampoo
  - 2- color
  - 3- brushing and combing
  - 4- setting
- (c) types of hair

(4) Hand care
- (a) daily care
  - 1- cleansing
  - 2- protection
  - 3- lubrication

(b) exercising the hands
1- wristshake
2- finger bouncing
3- finger taps
4- wrist circles
5- hand and arm coordination
(c) nails
1- polishing

f. Fashions
(1) Color
(a) basic facts
(b) language of color
1- hue
2- value
3- intensity
4- tint
5- shade
(c) color combinations
1- monochromatic
2- analogous
3- triadic
4- complementary
5- split-analogous
(d) color and emotional association
(e) general rules
(2) Clothes
(a) inventory
(b) basics
(c) planning
(d) camouflage
1- line
2- proportion
3- color
(3) Accessories
(a) size
1- proportion to figure type
(b) types
1- hats
2- shoes
3- gloves
4- handbags
5- jewelry
6- stockings
7- belts
8- glasses
(4) Care of clothes
(a) clothes closet
1- do's and don'ts
(b) dry cleaning
(c) washing
(d) iron-press

6. Gas Engine Trouble Shooting
a. Fundamentals of the four cycle engine
(1) Classroom study of the fundamentals
(2) Study of types of spark plugs
(3) Study of compression and its relationship to performance

(4) Compression test one or more engines
(5) Clean and adjust spark plugs for one or more engines

b. Servicing
(1) Study the operators manual for the servicing and actual maintaining of.
(a) air cleaner
(b) chassis lubrication
(c) battery
(d) tires and/or track assemblies
(2) Demonstrate the results of improper air cleaner servicing and chassis lubrication.
(3) Study of manual and textbook for servicing of
(a) clutch
(b) brakes
(c) front wheel bearings
(d) cooling system
(e) hydraulic systems

c. Carburetion
(1) Study parts and principles of carburetors.
(2) Using ½ pint gas tank, show the difference in gas consumption between the tractor in poor adjustment and in proper adjustment.
(3) Do actual carburetion adjustments.
(a) idle, load
(b) float level, fuel line connections
(4) Show what happens when dirty and improper fuels are allowed into the carburetor.

d. Ignition principles
(1) Explain the magnetic induction
(2) Present the gasoline ignition system so that it is understood by all students.
(3) Use schematic drawing of ignition system
(4) Use an ignition lash up showing battery, switch, coil breaker, distributor and spark plugs

e. Ignition timing and maintenance
(1) Demonstrate to students method of removing old points, condensers, etc. and installation of new parts.
(2) Have students remove old points, etc. and install new parts.
(3) Discuss, demonstrate and allow students to time by marks, first, then by use of timing light.

f. Fuel and Ignition systems -- Diesel
(1) Use slides, film strips, movies, or transparencies for demonstration of the diesel engine
(a) compression ratios
(b) fuel injection principles
(c) fuel injection system
(d) timing
(2) Demonstrate, discuss and have students replace fuel filters, injection nozzles and bleed fuel lines.
(3) Discuss and explain the importance of using clean fuels, and having qualified persons repair the diesel pumps and injectors.

g. Valves -- principles and function
   (1) Use schematic drawing of valves and valve system.
   (2) Explain and demonstrate the relation of the valves to the action of the pistons, crankshaft, and carburetion system.
   (3) Demonstrate and explain removal of engine head.
   (4) Allow students to remove engine heads needing valve service.
   (5) Explain and demonstrate proper valve grinding procedures..
   (6) Explain and demonstrate proper replacement of valves in engine head, allow student to replace valves.
   (7) Explain and demonstrate proper replacement of the engine head, allow student to replace engine head.

h. Valve adjustment
   (1) Use schematic drawing showing proper methods of adjusting valves.
   (2) Consult proper manuals for correct clearance of valve tappets.
   (3) Demonstrate proper procedures in adjusting valves.
   (4) Have all students properly adjust valves.

i. Electrical systems
   (1) Check and repair light. Install lights if needed.
   (2) Study of the generator, which includes removal, cleaning, installation of brushes, if necessary, and re-installation.
   (3) Explain the purpose of the voltage regulator and its relationship to the electrical system.

j. Trouble shooting
   (1) Have each group do one or more things to the engine so that they will not operate or will only operate poorly.
   (2) Have groups exchange engines and correct the situation.
   (3) Discuss correct methods of trouble shooting.
   (4) Have question-answer session on trouble shooting.

7. Small engines
   a. Principles of operation
      (1) Two-stroke cycle engines
      (2) Four-stroke cycle engines

   b. Components of engine
      (1) Design considerations of major components
      (2) Design considerations of lubricating systems

   c. Principles of ignition systems
      (1) Magneto ignition
      (2) Battery ignition

   d. Principles of Carburetion
      (1) Float type
      (2) Suction type

   e. Repair of units
      (1) Diagnosis
         (a) ignition
         (b) fuel
         (c) mechanical

(2) Overhaul
(a) engine disassembly
1- disassemble top, sides, bottom of engine
2- reconditioning cylinder walls
3- reconditioning valve mechanisms
4- servicing the piston, rod, and bearings
(b) engine assembly
1- procedure
2- manuals
3- special tools

8. Commercial Design
a. Materials and their use
(1) Introducing the artist's materials
(a) pencil
(b) pen
(c) brush
(d) ink
(e) transparent water color
(f) opaque water color
(g) paper
1- tracing paper
2- bristol board
3- illustration board
(h) erasers
(i) thumbtacks
(j) masking tape
(k) sharpeners
(l) T-square - triangle - ruler
(m) mechanical instruments
(n) paletter

b. Pencil drawing
(1) Fine line of sharp point drawing
(2) Chisel point of broad stroke drawing

c. Pen and ink drawing

d. Brush drawing

e. Wash drawing (transparent) black and white
(1) Flat washers
(2) Indefinite blending

f. Opaque water color painting (black and white)
(1) Painting flat tones
(2) Blending opaque tones
(3) Preparing the drawing

g. General consideration of form
(1) Definition of Form
(2) Construction of form
(3) Proportion of form
(4) Modeling of form

h. The human figure
(1) Basic form figure
(2) Proportions (Real or ideal)

(a) individual parts
(b) structual differences - male and female
(c) relative proportions of various ages

(3) Construction
(a) leg
(b) arm
(c) hand
(d) foot
(e) head

(4) Moveable parts

i. Simple anatomy and figure drawing
(1) Stitch figure drawing
(2) Skelton figure or a whole
(a) skull
(b) spinal column
(c) shoulder and arm bones
(d) thigh and leg bones
(e) bones of the foot

(3) Muscles
(a) head and neck - skull and muscles
(b) torso
(c) shoulder and arms
(d) leg and foot

j. The human figure in motion
(1) Movement of the spine and body
(2) Further consideration of movable parts
(3) Balance
(4) Walking and running
(5) Twisting and turning
(6) Foreshortening

k. Animal anatomy (Lower forus)
(1) Basic comparison
(2) Genexal bone structure
(3) Muscles (general survey)
(4) Movable parts and locomotion

l. Perspective
(1) Definition
(2) Formula for drawing in perspective
(3) Indoor and outdoor perspective
(4) Circle and irregular forms
(5) Figure in perspective
(6) Reflection and how to handle them

m. Composition and pictorial design
(1) Definition of composition and stress its importance
(2) Basic principles in spatial division and object placement
(3) Designing a picture in tone, rhythem, harmony and unity
(4) Problem of spatial balance
(5) Evolution of a composition

n. Landscape painting, interiors, furniture, still life
(1) Drawing from nature
(2) Sketching
(3) Material to use
(4) Techniques of still life construction